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10/584,386	04/19/2007	Jonathan Sebastian Howes	79257-337169	8999

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EXAMINER	
VASUDEVA, AJAY	
ART UNIT	PAPER NUMBER
3617	

MAIL DATE	DELIVERY MODE
12/18/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/584,386	HOWES ET AL.	
	Examiner	Art Unit	
	Ajay Vasudeva	3617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 June 2006* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/23/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following must be shown or the feature(s) canceled from the claim(s).

- the angle of the surface of at least one limb being variable (claim 4).
- at least one limb having variable camber (claim 5).
- at least one limb comprising a moveable flap (claim 6).
- a portion of at least one limb being moveable (claim 7).
- the "lower" portion of each limb being offset towards a front part of the hull (claim 20).

Note: Fig. 7A and 8A show the "upper" portion (not the lower portion) of each limb being offset towards a front part of the hull

No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Abstract

2. The abstract is objected to for the following reasons:

The form and legal phraseology often used in patent claims, such as "means" and "said," should not be used in the abstract.

Appropriate correction of "**hull means**" is requested.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1, use of the limitation "**wherein the two limbs each have a zero-lift surface which is angled to generate in use a component of hydrodynamic force directed away from the enclosed flow path when there is a net flow of water incident in the bow-to-stern direction**" (emphasis added) renders the claim indefinite.

(A) The limitation "a zero-lift surface which is angled to generate in use a component of hydrodynamic force directed away from the enclosed flow path" is vague and confusing.

It is first noted that a generation of hydrodynamic force "directed away" from the enclosed flow path implies that such is a "lift" component of the hydrodynamic force (not a drag component, which is parallel to the direction of relative motion). Further, the limitation "a zero-lift surface", by definition, means that the surface does not produce any lift. However, when such surface is "angled" to generate a hydrodynamic force directed away from the enclosed flow

path, the surface would cease to be a “zero-lift” surface. Therefore, "zero-lift surface" and "angled to generate ... force directed away from the … flow path” are mutually exclusive limitations. In other words, a surface cannot be a zero-lift surface when it is “angled” to generate a hydrodynamic force directed away from the flow path.

Applicant’s clarification and/or correction is requested. Applicants are also requested to indicate if they instead intended to recite the limitation as “two limbs each fixed at a zero-lift axis when the net flow of water is in a straight bow-to-stern direction”.

(B) Further, the examiner is not clear as to how each of the two limbs with zero-lift surfaces is capable of generating a hydrodynamic force directed away from the enclosed flow path.

With regard to the invention disclosed in the instant Application, it is Examiner’s position that when Applicant’s vessel is in motion, only one the two limbs – not both limbs -- would generate a hydrodynamic force directed away from the enclosed flow path when there is a flow of water in the bow-to-stern direction. The Examiner’s reasoning is as follows:

In Applicant’s instant invention, a vessel is provided with a loop keel having two limbs fixed at “zero lift axis” (an angle of attack that produces no lift) for a condition when the keel is “laterally stationary” with respect to the longitudinal direction of motion. As is well known, the angle between the “relative” water flow and zero lift axis of the foil defines the “real” or “apparent” angle of attack for the foil. Therefore, when a vessel is moving ahead, the relative water flow through the loop keel would be parallel to the “zero-lift axis” of the keel limbs (angle of attack relative to the zero-lift axis is zero), thereby failing to generate any lift. As such, the limbs would generate no hydrodynamic force other than drag. However, when the forward-

moving vessel begins to heel due to an upsetting moment, the keel undergoes a corresponding motion in both lateral as well as longitudinal directions. This alters the relative water flow through the keel, thereby changing the apparent angle of attack on the limbs (the vector sum of the water speed and direction, and the keel speed and direction, determines the strength and direction of the apparent water flow).

For example, in response to an upsetting wind load on the sail, the vessel would heel in a leeward direction, causing the windward limb of the keel to be raised and the leeward limb to drop. Due to a change in the forward and lateral motion of the keel, the relative angle of attack of the limbs is altered so that the limbs begin to experience a restoring force. This restoring force acts on the "inside" surface of the leeward limb and on the "outside" surface of the windward limb. This restoring force on the limbs generates a righting moment opposite in direction to the upsetting moment, and resists any further heeling. Note here that only the restoring force on the leeward limb (and not the windward limb) is directed away from the enclosed flow path. In fact, the restoring force on the windward limb is directed toward the enclosed flow path.

In Examiner's view, only in a keel with "asymmetric" and "non zero-lift" cambered limbs (as disclosed in WO 95/18036, fig. 4, included in Applicant's IDS) can "each" of the two limbs generate a hydrodynamic force that is directed away from the enclosed flow path.

Applicant is therefore requested to explain/clarify as to how each of the two limbs with zero-lift surfaces is capable of generating a hydrodynamic force directed away from the enclosed flow path.

Conclusion

5. Claims 1-20 have not been further treated on merit due to the indefinite nature of the claims, as discussed in ¶4 of this Ohfice action. However, Applicant may note that the prior art made of record in the attached PTO Form 892, but not yet applied, is considered pertinent to applicant's disclosure.

The cited prior art each shows a loop structure comprising two limbs defining an enclosed flow path, and is considered capable of providing a restoring moment.

Specifically, Danahy (US 4,058,076 A), as well as GB 2177353 A and WO 9518036 A1 (both cited in Applicants IDS) show a loop keel structure similar to the instant invention, and therefore, is expected to function in a similar manner. Additionally, some of the hydrofoils shown in the prior art would act as loop keels at slow speeds.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ajay Vasudeva whose telephone number is (571) 272-6689. The examiner can normally be reached on Monday-Friday 12:00 -- 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, S. Joe Morano can be reached on (571) 272-6684. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ajay Vasudeva/
Primary Examiner
Art Unit 3617